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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of

Atty. Docket

FELTS ET AL

FR000076

Serial No. 09/912,130

Group Art Unit 2613

Filed: July 24, 2001

Examiner Shawn S. An

Title: VIDEO ENCODING METHOD USING A WAVELET DECOMPOSITION

Commissioner for Patents
BOX APPEAL BRIEF - PATENTS
Alexandria, VA 22313-1450

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On: Oct. 8, 2004

By: Elissa De Luccy

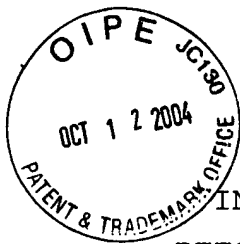
Sir:

Enclosed is an Appeal Brief in the above-identified patent application.

Please charge the fee of \$340.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By: [Signature]
Russell Gross, Reg. 40,007
Attorney
(914) 333-9631



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Atty. Docket

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On: Oct. 8, 2004

By: Elsa DeLucy

APPEAL BRIEF

Sir:

The rejection of Claims 1-2 is hereby being appealed, which are reproduced in the attached Appendix.

1. Real Party in Interest

The real party in interest is Koninklijke Philips
Electronics N.V., the assignee herein.

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2. Related Appeals and Interferences

The Appellant is not aware of any appeals or interferences that relate to the present application.

3. Status of all Claims

Claims 1-2 were submitted in the original application and are currently being appealed. Claim 3 was objected for being dependent upon a rejected Claim 1, but would be allowable if rewritten in independent form.

4. Status of Amendment

No Amendments were filed subsequent to the Final Rejection of June 22, 2004.

5. Summary of Claimed Subject Matter

The present invention is directed to an encoding method for the compression of a video sequence divided in groups of frames decomposed by means of a three-dimensional (3D) wavelet transform leading to a given number of successive resolution levels. The method being based on the hierarchical subband encoding process called "set partitioning in hierarchical trees" (SPIHT) and leading from the original set of picture elements (pixels) of the video sequence to wavelet transform coefficients encoded with a binary format, as described on page 1, lines 1-6, of the present application.

The coefficients being organized in trees and ordered in partitioning subsets -corresponding to respective levels of significance- by means of magnitude tests involving the pixels

represented by three ordered lists called list of insignificant sets (LIS), list of insignificant pixels (LIP) and list of significant pixels (LSP), as described on page 1, lines 7-10. The tests being carried out in order to divide said original set of pixels into said partitioning subsets according to a division process that continues until each significant coefficient is encoded within said binary representation, and sign bits being also put in the output bitstream to be transmitted, as described on page 1, lines 10-13.

The method also includes, for the estimation of the probabilities of occurrence of the symbols 0 and 1 in said lists at each level of significance, four models, represented by four context-trees, are considered, these models corresponding to the LIS, LIP, LSP and sign, as described on page 9, lines 22. As further described on page 9, lines 32-34, a further distinction is made between the models for the coefficient of luminance and those for the chrominance, without differentiating the U and V coefficients.

6. Issues To Be Reviewed on Appeal

Claim 1 stands rejected under 35 USC 102(e) as being anticipated by Pearlman et al. (U.S. Patent No. 6,671,413).

Claim 2 stands rejected under 35 USC 103(a) as being unpatentable over Pearlman et al. (U.S. Patent No. 6,671,413).

8. Argumets

I. Claim 1 Rejection

Claim 1 stands rejected under 35 USC 102(e) as being anticipated by Pearlman et al. (U.S. Patent No. 6,671,413).

Section 706.02 of The MPEP requires that a reference must teach every aspect of the claimed invention either explicitly or impliedly. Further, in order to establish anticipation, it is incumbent upon the Examiner to identify in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, (Fed. Cir. 1984).

In view of the above, it is respectfully submitted that the burden of showing that Pearlman et al. anticipates all of the features recited in Claim 1 has not been met. In particular, such features include "the estimation of the probabilities of occurrence of the symbols 0 and 1 in said lists at each level of significance...are considered".

In initially addressing this feature in the above rejection, Figure 4 of Pearlman et al. is being relied on. However, in Column 4, lines 21-22, Pearlman et al. clearly states that Fig. 4 is useful in understanding the concept of quadtree partitioning a set S into four subsets. Based on this, it is evident that Fig. 4 of Pearlman et al. does not disclose "the estimation of the probabilities of occurrence of the symbols 0 and 1 in said lists at each level of significance...are considered", as required by Claim 1. However, despite this point, the above rejection has been maintained.

In maintaining this rejection, column 9, lines 27-37, of Pearlman et al. is being relied on. However, in Column 9, lines 27-37, Pearlman et al. discloses:

"During subroutine 230, set S is partitioned in four equal sets O(S) during step S231. Each set O(S) is then tested to determine whether or not it is significant during step S233. In either case, the determination result is output to the communication channel during step S232."

Based on the above disclosure, it is evident that Pearlman et al. only discloses determining whether each set is significant. Thus, Pearlman et al. cannot be reasonably interpreted as disclosing "the estimation of the probabilities of occurrence of the symbols 0 and 1 in said lists at each level of significance...are considered", as required by the Claim 1. Therefore, it is respectfully submitted that this feature is not anticipated by Pearlman et al.

In view of the above-described distinctions, it is respectfully submitted that the invention of Claim 1 is not anticipated by Pearlman et al. Therefore, the Appellant respectfully requests that the final rejection of this claim be reconsidered and reversed.

II. Claim 2 rejection

Claim 2 stands rejected under 35 USC 103(a) as being unpatentable over Pearlman et al. (U.S. Patent No. 6,671,413).

In order to make a proper obvious rejection under 35 U.S.C. 103, MPEP Section 706.02(j) requires that the prior art reference (or references when combined) must teach or suggest all of the claim limitations. Further, either the references must expressly or impliedly suggest the claimed invention. Ex parte Clap, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)

In view of the above, it is respectfully submitted that Pearlman et al. neither teaches nor suggests all of the claim limitations. In particular, such features include "for the encoding of each bit, a context formed of d bits preceding the current bit and different according to the model considered for said current bit is used".

In addressing this feature in the above rejection, it appears that the Examiner feels that claim 2 would be obvious in view Pearlmann et al. teaching a 3-D wavelet transform being employed to video. However, the Applicant respectfully disagrees since Pearlman et al. discloses nothing in regard to encoding bits. In column 15, lines 56-60, Pearlman et al. only discloses:

"...blocks are coded independently into packets which are stored in a buffer memory. The final bitstream is generated by combining the packets in any arbitrary manner."

Based on the above disclosure, it is evident that Pearlmann et al. neither discloses nor suggests "for the encoding of each bit, a context formed of d bits preceding the current bit and different according to the model considered for said current bit

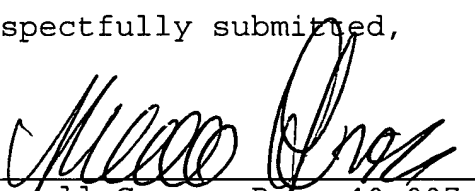
is used ", as required by Claim 2. Therefore, it is respectfully that this feature is distinguishable over Pearlmann et al.

In view of the above-described distinctions, it is respectfully submitted that the invention of Claim 2 is not unpatentable over Pearlman et al. Therefore, the Appellant respectfully requests that the final rejection of this claim be reconsidered and reversed.

Please charge the fee of \$320.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By


Russell Gross, Reg. 40,007
Attorney (914) 333-9631



A P P E N D I X

1. An encoding method for the compression of a video sequence divided in groups of frames decomposed by means of a three-dimensional (3D) wavelet transform leading to a given number of successive resolution levels, said method being based on the hierarchical subband encoding process called "set partitioning in hierarchical trees" (SPIHT) and leading from the original set of picture elements (pixels) of the video sequence to wavelet transform coefficients encoded with a binary format, said coefficients being organized in trees and ordered in partitioning subsets -corresponding to respective levels of significance- by means of magnitude tests involving the pixels represented by three ordered lists called list of insignificant sets (LIS), list of insignificant pixels (LIP) and list of significant pixels (LSP), said tests being carried out in order to divide said original set of pixels into said partitioning subsets according to a division process that continues until each significant coefficient is encoded within said binary representation, and sign bits being also put in the output bitstream to be transmitted, said method being further characterized in that, for the estimation of the probabilities of occurrence of the symbols 0 and 1 in said lists at each level of significance, four models, represented by four context-trees, are considered, these models corresponding to the LIS, LIP, LSP and sign, and a further distinction is made between the models for the coefficient of luminance and those for the chrominance, without differentiating the U and V coefficients.

2. An encoding method according to claim 1, in which, for the encoding of each bit, a context formed of d bits preceding the current bit and different according to the model considered for said current bit is used, said contexts being distinguished for the luminance coefficients, the chrominance ones - while differentiating the U and V planes - and for every frame in the spatio-temporal decomposition, these contexts being gathered in a structure depending on the type of symbols, coming from the LIS, LIP, LSP or from the sign bitmap, on the color plane Y, U, or V, and on the frame in the temporal sub-band.

3. An encoding method according to claim 2, in which a representation of said contexts is a three-dimensional structure CONTEXT filled with the sequences of d last bits examined in each case :

CONTEXT [TYPE] [chroma] [n°frame] where TYPE is LIP_TYPE, LIS_TYPE, LSP_TYPE, or SIGN_TYPE, and chroma stands for Y, U, or V.